

ABSTRACT

A STUDY OF SERUM HOMOCYSTEINE LEVELS DURING NORMAL PREGNANCY AND PREECLAMPSIA

INTRODUCTION:

Homocysteine is an aminoacid produced as a by product of protein metabolism. It is a non proteinaminoacid resulting from the demethylation of the essential aminoacid methionine. 50% is remethylated to methionine and 50% is transsulfurated to cystathionine, a source of cysteine which is aided by vit B12 and folic acid[1] Homocysteine concentration is regulated by genetic factor MTHFR gene mutation, nutritional factor, age and pregnancy.

Normal value is 5-15 micromol/lit. A study was done on changes in homocysteine levels in normal pregnancy [2] the results of which showed 5.6micromol/lit at 8-16 weeks, 4.3 at 20-28 weeks and 5.5 at 36-42 weeks of gestation. In non pregnant women it was 7.9 micromol/lit. It was concluded that serum homocysteine levels fall during pregnancy. Homocysteine concentration fall during pregnancy due to hemodilution, raised GFR, hormonal changes and increased fetal uptake.[3] Suboptimal methylation lead to increased levels of homocysteine. Hyperhomocysteinemia in pregnancy causes endothelial dysfunction as a result of oxidative stress, ultimately leading to vasculopathy and platelet dysfunction which causes pregnancy complications like PIH, recurrent pregnancy loss, IUGR, LBW, Placental abruption. It can also lead to congenital anomalies like cleft lip/palate and neural tube defects.

Second trimester elevation of homocysteine was associated with a 3.2 fold increased risk of preeclampsia [4]. The present study was planned to know the serum homocysteine levels in normal pregnancy and preeclampsia in South Indian population and also to know the correlation between severity of preeclampsia along with the effect of homocysteine levels on maternal and the fetal outcome. Since there is no significant variation of serum homocysteine levels with the mean gestational age we have chosen third trimester

AIM AND OBJECTIVE

To find any correlation between serum Homocysteine level in preeclampsia and normal pregnancy and to know the severity of preeclampsia whether it is mild/severe depending upon the elevated Homocysteine levels.

Study Design: Prospective case control study, observational study

Study Population: All antenatal women with gestational age group between 28-40 weeks of gestation.

Study Place: Department of Obstetrics and Gynecology, PSGIMSR.

Sample Size: 30 normal Antenatal women and 30 Preeclampsia patients

Study Duration: 1 year

INCLUSION CRITERIA

- All antenatal women with gestational age between 28 to 42 weeks of gestation

EXCLUSION CRITERIA

- Chronic hypertension/Abruptio placenta/DM /smokers/twin pregnancy/preterm labour/patient who are not willing to participate in the study/APL syndrome.

MATERIALS AND METHODS

Group 1: 30 preeclampsia patients with 2 readings BP >140/90 with or without proteinuria

Group 2: 30 normal antenatal women attending OP/admitted in ward for safe confinement within 28-40 weeks of gestation.

With detail history taking and routine antenatal investigations along with PIH investigations in group 2 like BT,CT,APTT,PT INR, fibrinogen, urine Albumin, uric acid. Severity of preeclampsia was diagnosed depending upon BP >160/90 presence of proteinuria and immanent symptoms. Serum Homocysteine level was done in all patients

SAMPLE COLLECTION METHOD:

- 5ml of venous blood is drawn from anterior cubital vein
- Collected in EDTA Tube
- Send to biochemistry lab within 30 minutes
- Homocysteine levels measured by Enzyme based immunoassay

RESULTS:

The mean homocysteine value in case is 9.989 ± 4.1 and the mean homocysteine level in control is 6.038 ± 2.03 , which found to be statistically significant, that is P value < 0.05 by independent t test. Elevated homocysteine levels were found in preeclampsia patients and it was found to be higher in severe preeclampsia when compared to nonsevere preeclampsia. Patients with elevated homocysteine level had increased BMI when compared to controls which was statistically significant. Most of the patients were primigravida. Patients with preeclampsia delivered by cesarean section when compared to controls. Serum homocysteine level was associated with IUGR but statistically not significant due to small sample size. Elevated homocysteine was associated with low birth weight babies.

CONCLUSION:

Many prospective and retrospective studies have proven that, hyperhomocysteinemia causes preeclampsia in pregnancy, recurrent pregnancy loss and IUGR. The raised levels of homocysteine correlated with the severity of preeclampsia and eclampsia. It is an easy test to perform and can be considered as a predictive marker in PIH patients. It also said that hyperhomocysteinemia is associated with lipid peroxidation which can cause oxidative stress and endothelial damage.

Supplementation with folic acid, B vitamins, nitric oxide donors decreases the homocysteine levels in pregnancy and restores the endothelial function and brings down the maternal morbidity and mortality. Most of these studies suggest that homocysteine is a mediator of endothelial damage and dysfunction which not only causes preeclampsia but also causes isolated IUGR and recurrent pregnancy loss in normotensive pregnant patients.

The pathophysiology of preeclampsia and IUGR is similar but increased levels of serum homocysteine is seen in preeclampsia and also has a strong correlation in preeclamptic toxemia. More studies and a larger scale is needed for the recommendation of this test as a predictive marker.